WHAT IS CLAIMED IS:

1. A process for the decomposition of fluorine compounds over a catalyst comprising a step of contacting said fluorine compounds, in the presence of water vapor, oxygen and an inert gas as a diluent gas, with a fluorine compounds decomposition catalyst and a catalyst the decomposition oft least one of CO, SO_2F_2 and N_2O to decompose said fluorine compounds.

2. A process for the decomposition of fluorine compounds as claimed in claim 1, wherein a gas containing said fluorine compounds is made in contact with said a fluorine compound decomposition catalyst, and then is made in contact with said a catalyst the decomposition oft least one of CO, SO_2F_2 and N_2O.

3. A process for the decomposition of fluorine compounds over a catalyst comprising steps of decomposing said fluorine compounds by contacting a fluorine compounds decomposition catalyst in the presence of water vapor and an inert gas as a diluent gas; adding oxygen or an oxygen-containing gas to a gas formed by said decomposition; and making said gas in contact with said a catalyst the decomposition oft least one of CO, SO_2F_2 and N_2O.

4. A process for the decomposition of fluorine compounds comprising a step of the decomposition and removing SO_2F_2 from a gas containing SO_2F_2, said step comprising a step of contacting said gas containing SO_2F_2 over a catalyst for decomposition of SO_2F_2 in the presence of water vapor and oxygen.

5. A process for the decomposition of fluorine compounds as claimed in one of claims 1, 3 and 4, wherein said a catalyst for the decomposition oft least one of CO, SO_2F_2 or N_2O contains at least one selected from Pd, Pt, Cu, Mn, Fe, Co, Rh, Ir and Au in the form of a metal or an oxide.

6. A process for the decomposition of fluorine compounds as claimed in claim 5, wherein said catalyst for the decomposition oft least one of CO, SO_2F_2 or N_2O further contains at least one oxide selected from La and Ba.

7. A process for the decomposition of fluorine compounds as claimed in claim 1 or 3, wherein said a catalyst for the decomposition oft least one of CO, SO_2F_2 or N_2O is selected from a catalyst of Pd and La carried on alumina, a catalyst of Pt and La carried on alumina, a catalyst of Rh and La carried on alumina, a catalyst of Au and La carried on alumina, a catalyst of Ir and La carried on alumina, a catalyst of Pd carried on alumina, a catalyst of Pt carried on alumina, a catalyst of Cu carried on alumina, a catalyst of Mn carried on alumina, a catalyst of Pd and W carried on titania and a catalyst of Co carried on alumina.

8. A process for the decomposition of fluorine compounds as claimed in one of claims 1, 3 and 4, wherein said gas having been decomposed by contacting with said catalyst for the decomposition oft least one of CO, SO_2F_2 or N_2O is put through water or an alkaline aqueous solution to remove hydrogen

fluoride and a water-soluble component contained in said gas.

9. A process for the decomposition of fluorine compounds as claimed in claim 1 or 3, wherein said fluorine compounds decomposition catalyst contains aluminum and nickel in the form of an oxide, and a ratio thereof in atomic ratio is from 50 to 99 mol% for aluminium and from 50 to 1 mol% for nickel.

10. A process for the decomposition of fluorine compounds as claimed in one of claims 1, 3 and 4, wherein a reaction temperature for said a catalyst for the decomposition oft least one of CO, SO_2F_2 or N_2O is from 650 to 850°C.

11. A process for the decomposition of fluorine compounds as claimed in claim 1, wherein said a fluorine compound is one selected from PFC, HFC, SF_6 and NF_3.

12. An apparatus for the decomposition of fluorine compounds comprising a reactor having a catalyst for decomposing said fluorine compounds and a catalyst for the decomposition oft least one of CO, SO_2F_2 or N_2O charged therein; a heater for heating said catalysts in said a reactor; a moisture supplying unit for adding moisture to said fluorine compounds supplied to said reactor; an oxygen supplying unit for adding oxygen or an oxygen-containing gas; and an inert gas supplying unit for adding an inert gas as a diluent gas.

13. An apparatus for the decomposition of fluorine compounds as claimed in claim 12, wherein said reactor having said catalyst for decomposing said fluorine compounds charged

upstream therein and said catalyst for the decomposition oft least one of CO, SO_2F_2 or N_2O charged downstream therein.

14. An apparatus for the decomposing a fluorine compounds comprising a reactor having a catalyst for decomposing said fluorine compounds charged upstream therein and a catalyst for the decomposition oft least one of CO, SO_2F_2 or N_2O formed by said decomposition charged downstream therein; a heater for heating said catalysts in said reactor; a moisture supplying unit for adding moisture to said fluorine compoundsupplied to said reactor; an inert gas supplying unit for adding an inert gas as a diluent gas; and an oxygen supplying unit for adding oxygen or an oxygen-containing gas to a gas containing at least one of HF, CO, SO_2F_2 and N_2O formed by decomposition of said fluorine compounds.

15. An apparatus for the decomposing a fluorine compounds comprising an apparatus for the decomposition ofnd removing SO_2F_2 from a gas containing SO_2F_2 comprising a reactor having an SO_2F_2 decomposition catalyst charged therein; and means for adding water and oxygen to said gas supplied to said reactor.

16. An apparatus for the decomposing a fluorine compounds as claimed in claim 12 or 14, wherein said catalyst for the decomposition oft least one of CO, SO_2F_2 or N_2O contains at least one selected from Pd, Pt, Cu, Mn, Fe, Co, Rh, Ir and Au in the form of a metal or an oxide.

17. An apparatus for the decomposing a fluorine compounds

as claimed in claim 12 or 14, wherein said catalyst for the decomposition oft least one of CO, SO_2F_2 or N_2O is selected from a catalyst of Pd and La carried on alumina, a catalyst of Pt and La carried on alumina, a catalyst of Rh and La carried on alumina, a catalyst of Au and La carried on alumina, a catalyst of Ir and La carried on alumina, a catalyst of Pd carried on alumina, a catalyst of Pt carried on alumina, a catalyst of Cu carried on alumina, a catalyst of Mn carried on alumina, a catalyst of Pd and W carried on titania and a catalyst of Co carried on alumina.

18. An apparatus for the decomposing a fluorine compounds as claimed in one of claims 12, 14 and 15, wherein said apparatus further comprises a gas scrubbing tower removing hydrogen fluoride and other water soluble components from a gas discharged from said reactor by contacting said gas with water or an alkaline aqueous solution.